

This listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) An electron beam recording apparatus comprising:
~~a rotational drive unit for rotationally driving a disk substrate having a surface on which a resist layer is formed;~~
~~an electron beam irradiation unit for irradiating an electron beam for exposure onto the surface of said resist layer in a freely deflectable manner;~~
~~a shift drive unit for shifting the irradiation position of the electron beam by a predetermined distance in the a radial direction of said disk substrate; for each one rotation by said rotational drive unit to advance the irradiation position of the electron beam; and~~
~~control means for forming a latent image corresponding to a predetermined pattern, in said resist layer by controlling the irradiation position caused by said electron beam irradiation unit on the surface of said resist layer in accordance with the rotation angle of said disk substrate caused by said rotational drive unit, the shift position caused by said shift drive unit and recording data that represents the predetermined pattern;~~
a first control unit for acquiring a rotational angle of said disk substrate from said rotational drive unit;
a second control unit for acquiring a shift position from said shift drive unit; and
a third control unit for forming a latent image corresponding to a predetermined pattern in said resist layer by controlling the irradiation position caused by said electron beam irradiation unit on said resist layer in accordance with said rotational angle of said disk substrate, said shift position and said predetermined pattern;
wherein said electron beam irradiation unit includes a beam-adjusting means system for adjusting the irradiation of said electron beam in such a manner as to spread

over a plurality of tracks in the direction of traversing the tracks on the surface of said resist layer in response to the irradiation position control by said third control means unit.

2. (Currently Amended) The electron beam recording apparatus according to claim 1, wherein said beam-adjusting means system is a high-speed deflector for deflecting said electron beam at a high speed in the radial direction of said disk substrate.

3. (Currently Amended) The electron beam recording apparatus according to claim 1, wherein said beam adjusting means system includes an aperture plate provided with a one-track aperture and a plural-track aperture which is expanded by at least a two-track length in the radial direction of said disk substrate, and a deflecting means system for deflecting said electron beam so as to selectively pass through the one-track aperture or the plural-track an aperture plate.

4. (Currently Amended) The electron beam recording apparatus according to claim 3, wherein said deflecting means system is a blanking plate.

5. (Currently Amended) The electron beam recording apparatus according to claim 3, wherein said deflecting means system is a high-speed deflector arranged between a blanking plate and the said aperture plate.

6. (Currently Amended) The electron beam recording apparatus according to claim 1, wherein when the irradiation position of said electron beam is at a first predetermined track and the rotation angle of said disk substrate is at a predetermined rotation angle, said beam-adjusting means system continuously irradiates the electron beam over said first predetermined plural number of tracks in the radial direction of said disk substrate towards the outer periphery side of said disk substrate from said first

predetermined track, and thereafter, when the irradiation position of the electron beam is at a second predetermined track that is apart from said first predetermined track by at least said first predetermined plural number of tracks towards the outer periphery side of said disk substrate and the rotation angle of said disk substrate is at said predetermined rotation angle, said beam-adjusting means continuously irradiates the electron beam over said second predetermined plural number of tracks in the radial direction of said disk substrate towards the outer periphery side of said disk substrate from said second predetermined track, so that a longitudinal continuous pattern longer than the track-to-track distance for said first predetermined plural number of tracks is formed as a latent image at said predetermined rotation angle of said disk substrate.

7. (Currently Amended) The electron beam recording apparatus according to claim 1, wherein said predetermined pattern is a pattern in which a servo zone and a data zone are repeated for each predetermined angle, and the said servo zone includes patterns extending over said plurality of tracks.

8. (Currently Amended) The electron beam recording apparatus according to claim 7, wherein the said servo zone includes a mark part which contains at least one of a clock signal, an address signal for representing address information on a track and a position detecting signal ~~for detecting a position on a track~~.

9. (Currently Amended) The electron beam recording apparatus according to claim 8, wherein said clock signal is formed in a servo clock area, said address signal is formed in an address mark area, and said position detection detecting signal is formed in a position detection mark area, respectively.

10. (Currently Amended) An electron beam recording method comprising steps of:

~~rotating a rotational drive step for rotationally drives a disk substrate having a surface on which a resist layer is formed;~~

~~an irradiation step for irradiating an electron beam for exposure onto the surface of said resist layer in a freely deflectable manner;~~

~~a shift drive step for shifting the irradiation position of said electron beam by a predetermined distance in the a radial direction of said disk substrate; for each one rotation of said disk substrate to advance the irradiation position of said electron beam; and~~

~~a control step for forming a latent image corresponding to a predetermined pattern, in said resist layer by controlling the irradiation position of said electron beam on the surface of said resist layer in accordance with the rotation angle of said disk substrate, the shift distance of the irradiation position of said electron beam in the radial direction of said disk substrate and recording data that represents the predetermined pattern;~~

acquiring a rotational angle of said disk substrate;

acquiring a shift position of said disk substrate; and

forming a latent image corresponding to a predetermined pattern in said resist layer by controlling the irradiation in said irradiating step on said resist layer in accordance with said rotational angle of said disk substrate, said shift position and said predetermined pattern;

wherein said irradiation irradiating step irradiates said electron beam in such a manner as to spread over a plurality of tracks in the direction of traversing the tracks on the surface of said resist layer in response to the irradiation position control in said control forming step.

11. (New) An apparatus for controlling an electron beam system comprising:
a first control unit for acquiring a rotational angle of a rotating disk substrate;
a second control unit for acquiring a shift position of said rotating disk substrate;
and

a third control unit for forming a latent image corresponding to a predetermined pattern in said disk substrate by controlling an irradiation position caused by an electron beam on said disk substrate in accordance with said rotational angle of said disk substrate, said shift position and said predetermined pattern, wherein said third control unit adjusts irradiation of said electron beam to spread over a plurality of tracks in the direction of traversing the tracks on said disk substrate.

12. (New) A method for controlling an electron beam system comprising the steps of:

acquiring a rotational angle of a rotating disk substrate;
acquiring a shift position of said rotating disk substrate; and

forming a latent image corresponding to a predetermined pattern in said disk substrate by controlling an irradiation position caused by an electron beam on said disk substrate in accordance with said rotational angle of said disk substrate, said shift position and said predetermined pattern, wherein said forming step further comprises adjusting irradiation of said electron beam to spread over a plurality of tracks in the direction of traversing the tracks on said disk substrate.